Signalized Superstreet Operation

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Signalized Superstreet Operation

1) Concept
2) Signal Coordination
3) Experiences / Challenges

In The World Today…

- More vehicles on the road
- Higher fuel prices → Higher Public Expectation & Frustration
- More signalized intersections → More Vehicle Delay (potential)

Simple Solution

- Move more vehicles…
- More efficiently…
- Through more signals…
- In a safe manner

Easy enough???

Superstreet Concept

1) Sidestreet vehicles must turn right

- Fewer vehicle phases (efficiency)
  - fewer vehicle phases means more time for the remaining phases
  - everyone can appreciate the simplicity of a two-phase intersection (it's your turn, then it's my turn, your turn, then my turn, etc…)
- Fewer vehicle conflict points (safety)

Signal Phasing Consequences

MAIN STREET EFFICIENCY

UNSIGNALIZED ROAD

100% 'GREEN' TIME

70% 'GREEN' TIME

50% 'GREEN' TIME

35% 'GREEN' TIME

Superstreet Concept (cont)

2) Each sidestreet approach is controlled by its own signal controller

- Two, independent, one-way intersections
  - Each intersection controls one sidestreet approach and one mainstreet approach
  - Each sidestreet and mainstreet pair operate independent of the other pair

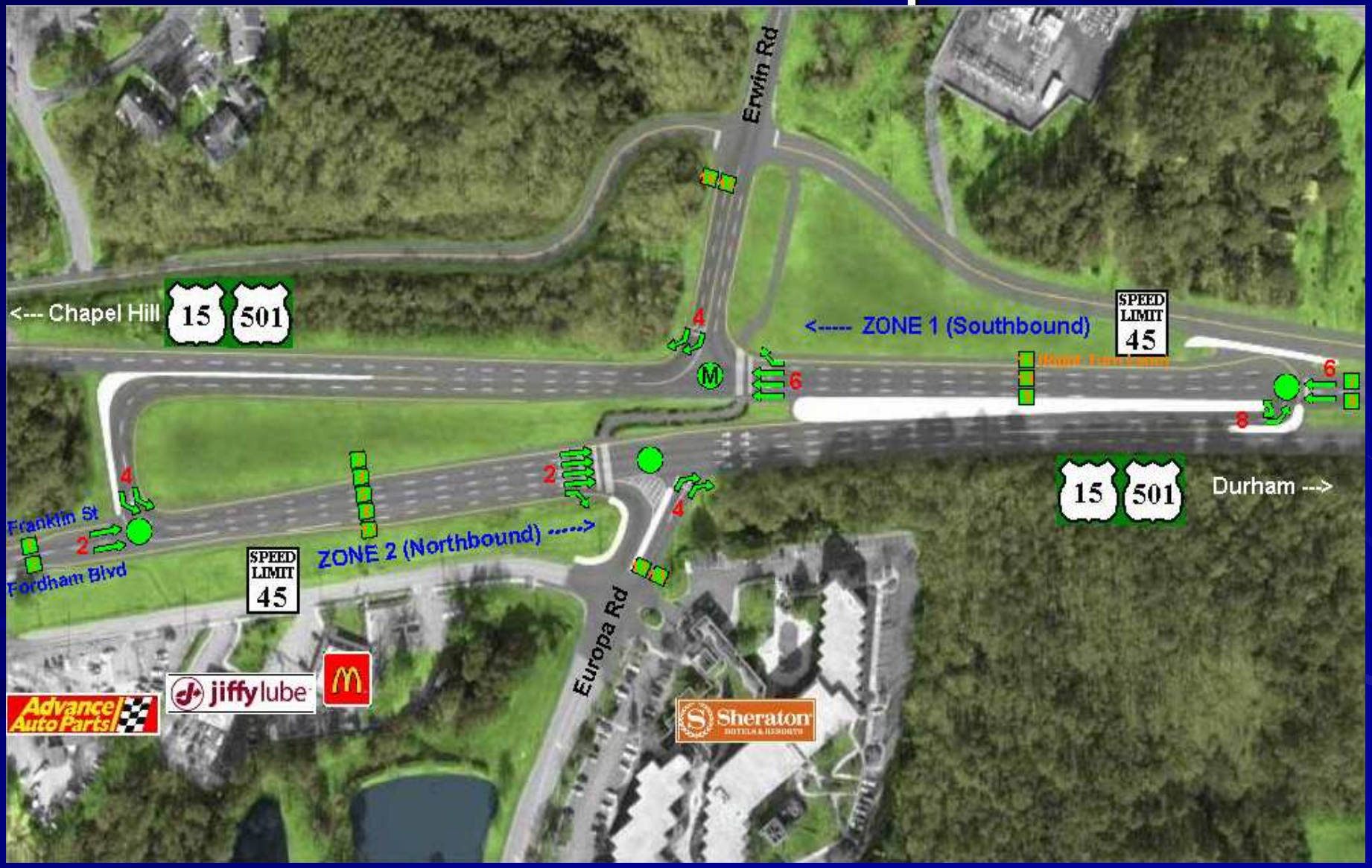
Examples

US 15-501 Chapel Hill (single superstreet)
http://www.ncdot.org/projects/superstreet/

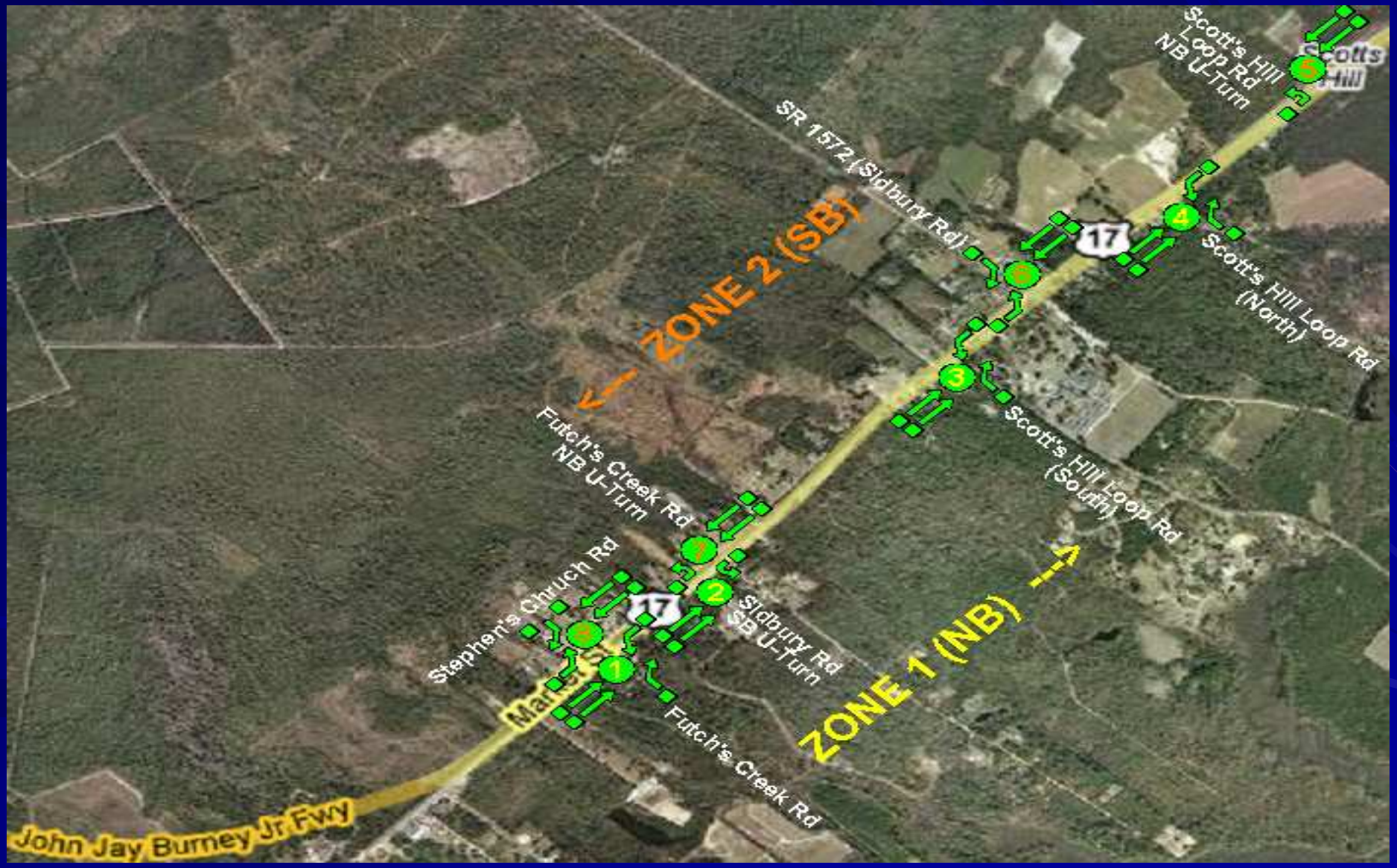
US 17 Scott's Hill (multiple superstreet)

US 17 Leland "Hill" (multiple superstreet)

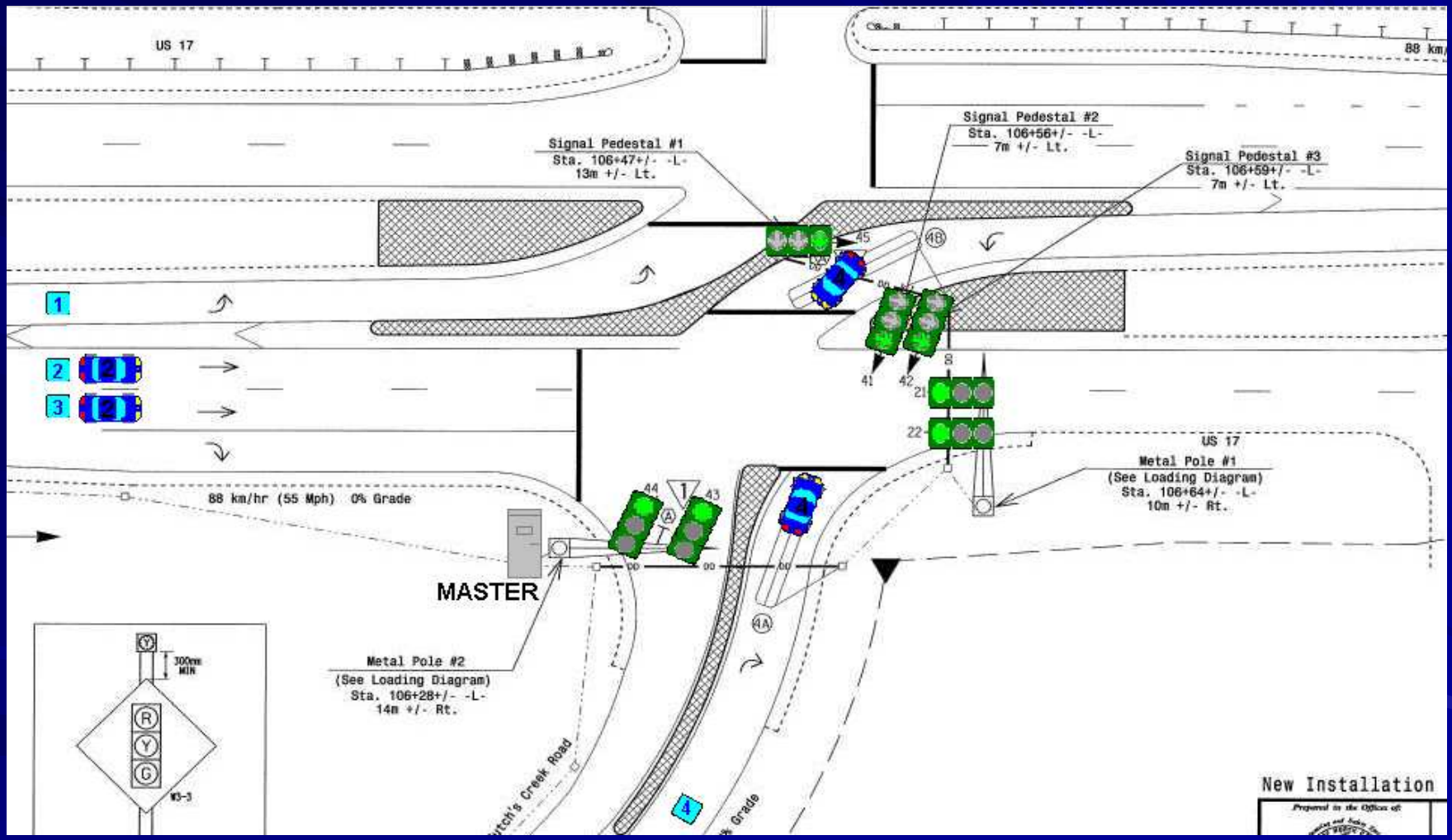
US 15-501 in Chapel Hill



US 17 in Scott's Hill



US 17 in Scott's Hill



Experiences / Challenges

- US 15-501 in Chapel Hill
  - Superstreet is surrounded by traditional 6 & 8 phase intersections
    - Cycle Length Restrictions (must abide by largest cycle length for arterial progression)
  - Tremendous Northbound U-Turn Volumes (500+ vph in PM Peak)
  - First superstreet design for North Carolina (trial and re-trial situation)

Experiences / Challenges

- US 17 in Scott's Hill
  - Definite directional flow (SB in AM, NB in PM) → each direction runs an independent time of day schedule
  - Able to maintain short cycle lengths (70 sec in peaks, 40 sec overnight)

Superstreet Concept Summary

1) Sidestreet vehicles must turn right
2) Each sidestreet approach is controlled by its own signal controller

Improves:

Efficiency (increasing mainstreet ‘Green’ time)

Safety (reducing vehicle conflict points)

Note: A superstreet replaces a single intersection

Thank You

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